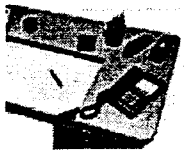
**Kevin Golden**
02/11/02 02:07 PM

To: Megan Williams/P2/R8/USEPA/US@EPA
cc:
Subject: Comments on Region 8 Modeling report

----- Forwarded by Kevin Golden/P2/R8/USEPA/US on 02/11/02 02:06 PM -----



**Karen Blanchard**
02/11/02 08:14 AM

To: Larry Svoboda/P2/R8/USEPA/US@EPA, Kevin Golden/P2/R8/USEPA/US@EPA
cc: Bill Harnett/RTP/USEPA/US@EPA, Melissa Mccullough/RTP/USEPA/US@EPA, Joe Tikvart/RTP/USEPA/US@EPA
Subject: Comments on Region 8 Modeling report

Sorry to take so long getting back to you. Joe Tikvart and I agree with the draft comment letter in the attached file. Let me know if you need division director signoff on it.

----- Forwarded by Karen Blanchard/RTP/USEPA/US on 02/11/02 10:28 AM -----

**Melissa Mccullough**
01/25/02 10:09 AM

To: Karen Blanchard/RTP/USEPA/US@EPA
cc:
Subject: Comments on Region 8 Modeling report

Karen - here are our comments on the Region 8 report on the methods for modeling the ND increment. If it is OK, it should be forwarded on to Megan Williams, with a cc: to Larry Svoboda and Kevin Golden.

thanks,
melissa

review of R8s report on ND modeling.\

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Internal EPA Document - Deliberative, Do not cite or quote

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OAQPS Review of the Region VIII January 2002 Draft report:
Dispersion Modeling Analysis of PSD Class I Increment Consumption in North Dakota and Eastern Montana

This report reflects those modeling approaches and parameters which OAQPS and the Region agreed best characterize the status of the Class I increment in North Dakota (ND) and eastern Montana. As such, OAQPS believes that this modeling effort best represents increment consumption in the described as for the purposes of implementing the Clean Air Act program for the Prevention of Significant Deterioration (PSD). Some more detailed comments follow.

The introduction provides a good overview of the issue background and correctly describes the final approach as one that represents the best methodology following EPA guidance and regulatory principles. We would suggest that you also add some language to note that this approach also best meets the *intent* of the modeling provisions -- to characterize the potential for increment violations under expected emissions and locally realistic weather patterns. We suggest this because we would not want the public to think that we are only using this approach because it is written in the rules and guidance. It is most important that this approach best fulfills the purpose of the increment modeling effort for PSD.

It is very good that this report points out where the ND information was used – such as the CEM data and changes to default settings. This shows that EPA is not averse to using new or different information, so long as it adequately fulfills the purpose intended as accurately as the guidance approach would, and that we will check to make sure that it does so. The use of the CEM data to select the model's emissions input is as we agreed, and the 90th percentile level of the emission rates, which you chose for the model input, seems reasonable to characterize high emissions.

For the conclusions, we agree with your idea of summarizing the violations numbers. We might suggest that you summarize the comparison of the ND Department of Health and EPA modeling approaches and why this approach best characterizes the needed information for PSD. In this way, the public can have sufficient understanding of the issue to appropriately evaluate any conflicting information.

Although you requested a broad review, our modelers provided few more specific comments on the modeling report. These are attached for your information. If you have questions about these specific comments, please email the comment's originator directly.

From Todd Hawes:
- Under section 2.1.3 (Calmet Model Control Settings), the table numbering in the text does not correspond with the actual table numbers that are shown.
- On Table 2-4 (Non-IWAQM Settings Used by EPA in Calpuff Control File), the BCKO3 variable is reduced from 80 ppb to 30 ppb. The reason given is that the value appears to be too high for North Dakota conditions, and therefore was reset to 30 ppb. I feel that a better justification for this reduction is warranted, other than "it appears too high"
- In Section 3.1 - Current Year Inventory - similarly, the 90th percentile cumulative actual emission rate was modeled because "this seems like the most representative method". Why not the 95th percentile to be more conservative? Again, a better justification is warranted.

From John Irwin (previously forwarded to Kevin Golden):

Basically you have 25 surface stations, 6 upper air stations, and 96 precipitation stations in the analysis. Domain covers essentially all of ND, a bit of the top of SD, and a bit of the eastern edge of MT. Cell face heights are: 22, 50, 100, 250, 500, 1000, 2000, and 4000 m. Grid size = 10 km

I like the settings chosen except for:

TERRAD = 100 km
R1 = 125 km
R2 = 100 km
IKINE = 1
LVARY = 1

1. I do not have a terrain height map for ND, but given grid cells of 10km on a side, I would have picked TERRAD of about 30 km (3 grids), rather than 100 km. TERRAD controls how far out terrain flows from a hill or valley wall can have on local winds. By setting TERRAD = 100km, we are saying the hills 100 km away are affecting local winds, which is hard to envision.

2. R1 and R2 affect how the surface and upper air observations are blended into the Stage 1 winds, and define where the Stage 1 winds are equal in weight to the observations surface and upper air winds. With the values chosen, I think you have lost all the possible value-added of Stage 1 processing, and are left with either a) a 1/r2 interpolated wind field (which is what Stage 1 starts with), or b) a 1/r2 wind field, with winds looking at any one level, identical to one another in the near-vicinity of observation locations. Years ago, in discussing R1 and R2 with Joe Scire, his take was the smaller R1 and R2 the better, even R1 = 1 km and R2 = 10 km. The idea of R1 and R2 is to 'reenter' the observations where you have them, but not have them erase the terrain effects teased in during the Stage 1 processing. By selecting large R1 and R2 values, you essentially negate the Stage 1 terrain adjustments.

3. IKINE is usually set to 0. This is an option that usually causes more trouble than it solves. By allowing the wind to be 'blocked' in the surface layer, the winds in layers 2 and 3 (above) are sometimes 'adjusted . Then when the divergence minimization is run, it often leaves behind

'strange jets or winds' in layers 2 and 3. Better to leave IKINE = 0.

4. Since Stage 1 starts with a 1/r2 interpolation, all grids are within reach of some observations initially. Thus, you likely do not need to set LVARY on.

Summary

The sentence ..."Calpuff would replace ...", is incorrect and misleading. Calpuff has not been proposed to 'replace' MESOPUFF II. MESOPUFF II is currently listed as an 'alternative' model in Appendix B of Appendix W. There is no refined model suggested for use in the current version of Appendix W for long range transport (LRT) modeling. Thus for LRT modeling, one must use an alternative model. Appendix B of Appendix W is not meant to be a comprehensive listing of all alternative models. To suggest that one is restricted in choosing alternative models to those listed in Appendix B is incorrect, could be contested by looking at Model Clearinghouse records where alternative models have been approved (for the most part, none of them are listed in Appendix B).

I do not have the expertise to comment on the emission characterization issues.

I would not be concerned with Calpuff possibly 'underestimating' 24-hr impacts, as might be deduced from the comparisons. If anything, I would think the comparisons suggest that Calmet/Calpuff is doing quite well.

Whether the analysis can be improved is uncertain. But, it would be interesting to see what would happen if you set TERRAD = 30 km, R1 = 1 km, R2 = 10 km, LVARY = 0, and IKINE = 0. It may provide no serious differences. It may provide wind fields that look strange. If the latter occurs, I suspect that in filling in for missing upper air soundings, something happened that was unintentional.